

to provoke the interference. The actions in this Amendment are summarized so as to help the new Examiner facilitate his review of the pending matter.

The current application is one of a family of patents which are either continuations or continuations-in-part of a long series of applications which had their origination with a filing date of August 10, 1995.

The applicant recognized that another party obtained US Patent 6,285,027, and within one year of the issuance date of that patent, applicant submitted an Amendment dated September 3, 2002 copying the claims of the '027 patent, adding other claims and filing a statement to provoke an interference.

The above identified Final Office Action was issued February 26, 2003 in which the Patent and Trademark Office withdrew consideration of certain claims, and identified where in certain proposed counts the Examiner stated there was insufficient basis to support the counts, especially as to newly submitted claims 99 and 115-120. During a telephone interview with the Examiner, the undersigned pointed out that the current application is a continuation of a series of prior applications which were incorporated by reference, but the Examiner indicated he had not found such reference in the file. Submitted herewith is a copy of the Filing Receipt identifying all the related applications and a copy of the Statement filed with Serial No. 901,428 identifying all these applications as well as incorporating them by reference. In particular, US Patent No. 5,689,111 issued on November 18, 1997, which has some inventors in common, is on that list.

In view of the above, it is believed that the issue of whether or not the subject matter of the newly submitted claims was supported by the specification overlooked the fact that the '111 patent had been incorporated by reference, and thus, issues relating to the timing of pulsing the ions is properly supported and identified, if not in the current specification,

at least in the referenced '111 patent which was incorporated by reference.

In order to more simply move this matter towards the provoking of an interference, the undersigned has canceled claims all claims except 99 and 115-120.

Independent of whether or not the Examiner should have withdrawn claims 66-79, 95-104, 106-111 and 115-120 from consideration, that issue is now mooted as all claims except claims 99 and 115-120 have been canceled. Such claims have been canceled, without prejudice, as a number of those claims have already been indicated as allowable and may be the subject of separate divisional applications. Additionally, claims 33-39, 41-53 and 56-65 had been rejected under 35 USC 103, and claims 112-114 had been rejected under 35 USC 112. Some or all of these claims will again be re-presented in separate divisional or continuation applications, as appropriate.

Turning now to the essence of the matter now pending in the Patent Office, applicant hereby again requests that an interference be provoked and has now limited the counts to counts 1 and 2, below. Count 1 is identical to claim 1 of the '027 patent, and count 2 is substantially identical to that claim.

#### Count 1

A method of effecting mass analysis on an ion stream, the method comprising:

- (a) passing the ion stream through a first mass resolving spectrometer, to select parent ions having a first desired mass-to-charge ratio;
- (b) subjecting the parent ions to collision-induced dissociation to generate fragment ions;
- (c) trapping the fragment ions and any remaining parent ions;
- (d) periodically releasing pulses of the trapped ions into a Time-of-Flight instrument to detect ions with a second mass-to-charge ratio; and

(e)providing a delay between the release of the pulses of trapped ions and initiation of push-pull pulses in the time of flight instrument, and adjusting the delay to improve the duty cycle efficiency of ions with the second mass-to-charge ratio.

Count 2

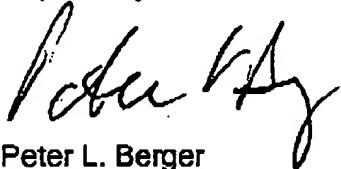
A method of effecting mass analysis on an ion stream, the method comprising:

- (a) passing the ion stream through a first mass resolving spectrometer, to select parent ions having a first desired mass-to-charge ratio;
- (b) subjecting the parent ions to collision-induced dissociation to generate fragment ions;
- (c) trapping the fragment ions and any remaining parent ions;
- (d) periodically releasing pulses of the trapped ions into a Time-OF-Flight instrument to detect ions with a second mass-to-charge ratio; and
- (e) providing a delay between the release of the pulses of the trapped ions and initiation of pulses in the Time-Of-Flight instrument, and adjusting the delay to improve the duty cycle efficiency of ions with the second mass-to-charge ratio.

Submitted herewith is reference to the original submission showing support for the individual elements in the claims in counts 1 and 2 as found in the current specification as well as additional support found in the specification relating to the incorporated by reference '111 patent.

In view of the above action and comments, it is respectfully requested that an interference be declared between this application and the '027 patent under 37 CFR 1.607.

Respectfully submitted,



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Peter L. Berger  
Reg. No. 24, 570  
LEVISSON, LERNER, BERGER & LANGSAM, LLP  
757 Third Avenue, Suite 2400  
New York, New York 10017  
Tel. 212-486-7272  
Fax 212-486-0323

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Table I

Claims 1 and 2

Claims 1(a)-(c) of U.S. Patent No. 6,285,027	Support in Pending U.S. Pat. No. 6,011,259 (application No. 09/901,428).	Examiner's rejection of support cited in '428 application and basis for overcoming said rejection.	Additional support cited in U.S. Pat. No. 5,689,111 (incorporated by reference into the '428 application).
1 A method of effecting mass analysis on an ion stream, the method comprising: (a) passing the ion stream through a first mass resolving spectrometer, to select parent ions having a first desired mass-to-charge ratio.	Column 8, lines 55-57 of the '259 patent (p. 15, lines 17-19 of the application).	No rejection cited.	As stated in column 3, line 58 - column 4, line 2: "The ions are formed into a beam 21 by a multipole ion guide having round rods 11 and are so collimated and transferred into the pulsing region of the time-of-flight mass analyzer by transfer ion optic lenses."
(b) Subjecting the parent ions to collision-induced dissociation to generate fragment ions	Column 8, lines 1-7 of the '259 patent (p. 4, lines 4-7 of the application).	No rejection cited.	Column 4, lines 5-11 states: "Multipole ion guides extending through multipole vacuum pumping stages are described in U.S. patent application serial numbers 08/645,836 and 08/202,505, the disclosures of which are hereby incorporated by reference. Alternatively, separate multipole ion guides in separate vacuum pumping stages can be used."

<p>(c) Trapping the fragment ions and any remaining parent ions</p>	<p>Column 2, lines 50-54 (p.3, lines 21-23-p.4, line 1 of the application).</p>	<p>Column 2, lines 50-54 states that "4. Under background of invention, does not recite, "trapping both fragmented ions and any remaining parent ions nor are these lines directly connected to ('239)'s claimed invention"</p> <p>Column 2, lines 50-54 states that "Alternatively, the ion multipole ion guide can be operated in a manner where the ions are trapped within the ion guide internal volume which is bounded by the evenly spaced rods or poles of the ion guide before being transmitted to the pulsing region of the TOF mass analyzer."</p> <p>Furthermore, column 9, lines 1-9 of the specification, was cited within the application, yet not referenced by the Examiner. The supporting reference recites that "in one embodiment of the invention the ion beam is transmuted into the multipole ion guide which is operated in a mass selective trapping mode. When the multipole ion guide has been filled to the desired level, all or a portion of the ions in the linear multipole ion guide trap are fragmented using collisional induced dissociation. <u>All</u> or a portion of the trapped ions are then transmitted to the pulsing region of the TOF mass analyzer where they are accelerated into the TOF flight tube and <math>m/z</math> analyzed." It is implicitly understood that fragmenting "all or a portion" of the ions will result in a mixture of both parent and daughter ions.</p> <p>Lastly, the fact that all or a portion of the ions may then be "pulsed" to the TOF subsequent to fragmentation, implies that the ions are pulsed, or "periodically released" into the TOF (as in claim 1, part d of the '027 patent), or "delayed" prior to being released into the TOF (as in claim 1, part e of the '027 patent).</p>	<p>Column 5, lines 6-Column 6, line 5: "To make use of the limited number of ions generated in the ion storage 110, some sort of ion storage mechanism in-between the analysis cycles is required.</p> <p>Fig. 3 shows a section of a time-of-flight mass spectrometer that utilizes an existing RF-only multipole ion guide being used in the ion storage mode of operation with appropriate power supply and pulse drive generators."</p> <p>Additionally, "all or a portion of" Column 8, lines 18-25: "The delay time <math>t_2</math> can be changed to allow different sections of the original ion beam, i.e. different <math>m/z</math> packages, to accelerate perpendicular to their original direction towards the flight tube 35 to be detected for mass analysis. In this example, a delay time <math>t_2</math> was chosen to pulse only a narrow range of ions centered around mass (<math>M_2</math>) 53 which were accelerated in the direction 63 at the instant the field was turned on."</p>
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<p>(d) Periodically releasing pulses of trapped ions into a time of flight instrument to detect ions with a second mass-to-charge ratio</p>	<p>Column 8, lines 31-35 of the '259 patent (p.14, lines 2-7 of the application).</p>	<p>The Examiner stated that "no mention of periodically releasing pulses of trapped ions... with a second mass to charge ratio is seen".</p>	<p>Column 4, lines 37-47: By applying a pulsed electric field momentarily between the repeller lens 23 and the draw-out lens 24, a group of ions 33 starts to move instantaneously in the direction 55, through the second stage acceleration field set by the plates 24 and 35 and towards the field free drift region 60 surrounded by the flight tube 33. The pulsed electric field generated by the pulsing of the repeller lens 23 establishes the start time for the measurement of the flight time distribution of ions arriving at the detector 36.</p>
			<p>Additionally, column 7, lines 21-26: As the voltage on the exit lens 15 is switched from level 78 to 77 for a short duration (of the order of microseconds), high density ion bunches are extracted collision free from the low pressure storage region 72 and injected into the orthogonal time-of flight analyzer.</p>

<p>(c) providing a delay between the release of the pulses of trapped ions and initiation of push-pull pulses in the time of flight instrument, and adjusting the delay to improve the duty cycle efficiency of ions with the second mass-to-charge ratio</p>	<p>Column 7, lines 36-43 (p.13, lines 5-12 of the application). Column 12, lines 10-14 (p.22, lines 18-19 of the application). Column 13, lines 1-2 (p.24, lines 8-10 of the application). Column 14, lines 13-17 (p.26, lines 15-19 of the application).</p>	<p>The Examiner states that neither the term "delay" or "adjusting the delay" is recited in Column 7, lines 36-43 which states: The "Timing... of the ion pulse released from the multiple ion source into the pulsing region is critical to the mass spectrometer performance. Specific sequence control of the ion release function... provides improved duty cycle performance."</p>
<p>• Count 2 is essentially the same as Count 1 except that it substitutes the term "push-pull pulses" with "pulses". These two terms have essentially the same meaning.</p> <p>Additional support for this claim was cited in the application, yet not referred to by the Examiner: Column 12, lines 10-14; Column 13, lines 1-2 and Column 14, lines 13-17 each specifically teach that adjusting the delay of the ions will result in increased performance, i.e. column 12, lines 10-14 state that "pulsing the ions with proper timing can selectively remove time separated <math>m/z</math> ions as the pulsed ion packet transverses the flight tube. This is referred to as the preferred method for improving duty cycle in column 13, lines 1-2.</p>	<p>Column 7, lines 36-43 of Whitehouse is merely referring to a general discussion of a TOF detector, as compared to the 3-D ion trap of Douglas.</p>	<p>Column 7, line 65- Column 8, line 6. "The power supply 91 sets the desired upper and lower voltage levels to be delivered to the lenses at all times. The electrically isolated fast switching circuitry 92 controls synchronously the desired voltage levels of the lens electrode 15 and repeller plate 23 to be switched back and forth during the designated time intervals controlled by the pulse and delay generating devices 93, which is an accurate timing device, which is in turn controlled by the interface user."</p>



**UNITED STATES PATENT AND TRADEMARK OFFICE**

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UNITED STATES PATENT AND TRADEMARK OFFICE  
WASHINGTON, D.C. 20231  
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APPLICATION NUMBER	FILING DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	DRAWINGS	TOT CLAIMS	IND CLAIMS
09/901,428	07/09/2001	2881	472	840.052203	9	33	2

**CONFIRMATION NO. 8546**

**UPDATED FILING RECEIPT**

Levisohn, Lerner, Berger & Langsam  
Suite 2400  
757 Third Avenue  
New York, NY 10017



"OC000000007011856"

Date Mailed: 11/02/2001

Receipt is acknowledged of this nonprovisional Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please write to the Office of Initial Patent Examination's Customer Service Center. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).

**Applicant(s)**

Craig M. Whitehouse, Branford, CT;  
Thomas Dresch, Branford, CT;  
Bruce Andrien, Branford, CT;

**Domestic Priority data as claimed by applicant**

THIS APPLICATION IS A CON OF 09/676,124 09/29/2000  
WHICH IS A CON OF 09/373,337 08/12/1999 PAT 6,188,066  
WHICH IS A CON OF 08/794,970 02/05/1997 PAT 5,962,851  
WHICH IS A CON OF 08/645,826 05/14/1996 PAT 5,652,427  
WHICH IS A CON OF 08/202,505 02/28/1994 ABN  
AND A CON OF 09/448,857 11/23/1999 ABN  
WHICH IS A CON OF 08/971,521 11/17/1997 PAT 6,020,586  
WHICH IS A CIP OF 08/689,459 08/09/1996 PAT 5,689,111  
WHICH IS A CON OF 08/694,542 08/09/1996 PAT 6,011,259  
WHICH CLAIMS BENEFIT OF 60/002,117 08/10/1995  
AND CLAIMS BENEFIT OF 60/002,118 08/10/1995  
AND CLAIMS BENEFIT OF 60/002,122 08/10/1995  
(\*) Data inconsistent with PTO records.

**Foreign Applications**

**RECEIVED NOV 07 2001**

If Required, Foreign Filing License Granted 08/08/2001

Projected Publication Date: Request for Non-Publication Acknowledged

Non-Publication Request: Yes

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Application of: Whitehouse et al.

Serial No.: To be assigned

Filing Date: July 8, 2001

For: Multipole Ion Guide  
Mass Spectrometry  
with MS/MS<sup>n</sup> Analysis

Attorney Docket No.: 840.052.203

Patent Application

Assistant Commissioner for Patents  
Washington, D.C. 20231

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TECHNOLOGY CENTER 2800Additional Claims to Priority

...which is a continuation of U.S. Patent Application Serial No. 08/645,826 filed May 14, 1996 (issued as U.S. Patent No. 5,652,427 on July 29, 1997), and which is a continuation of U.S. Patent Application Serial No. 08/202,505 filed February 28, 1994 (abandoned); and the priority of U.S. Patent Application Serial No. 09/448,857 filed November 23, 1999, which is a continuation of U.S. Patent Application Serial No. 08/971,521 filed November 17, 1997 (issued as U.S. Patent No. 6,020,586 on February 1, 2000) which is a continuation of U.S. Patent Application Serial No. 08/689,459 filed August 9, 1996 (issued as U.S. Patent No. 5,689,111 on November 18, 1997); and which claims the priority of U.S. Provisional Application Serial No. 60/002,118 filed August 10, 1995, and U.S. Provisional Application

Serial No. 60/002,122 filed August 10, 1995. The priority of all of the prior applications is claimed, and the disclosures of those applications are fully incorporated herein by reference.-

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